Program

DAY 1: 25/10/2023

Welcome address: VW-Foundation and conference chairs	8:45 - 9:00
SESSION 1/1: THeory: new concepts and mathematical foundations. Chair: Anna Levina	9:00-10:30
Keynote: Christof Teuscher, Material and physical reservoir computing for beyond-CMOS electronics	9:00-10:00
TH.C1: **Johannes Zierenberg,** Flexible tuning to task requirements via input statistics, local learning, and homeostatic plasticity	10:00-10:30
Coffee break	10:30-11:00
SESSION 1/2: THeory: new concepts and mathematical foundations	11:00-12:00
TH.C2: **Guillaume Pourcel**, Recurrent Neural Networks: from prediction to representation, a dynamical systems perspective	11:00-11:30
TH.C3: **Gouhei Tanaka**, Diverse-timescale echo state networks for multiscale modeling	11:30-12:00
Lunch break	12:00-13:30
SESSION 2: Physical Substrates: materials, devices, micro-architectures. Chair: Thomas Van Vaerenbergh	13:30-16:00
Keynote: Julie Grollier, The power of Equilibrium Propagation for training neuromorphic systems	13:30-14:30
PS.C1: **Melika Payvand**, Dendritic computation through exploiting resistive memories as both delays and weights	14:30-15:00
PS.C2: **Anas Skalli**, A high performance fully tunable laser-based neural network	15:00-15:30
PS.C3: **Hermann Osterhage**, Neuromorphic matter bottom-up constructed from individual atoms	15:30-16:00
Coffee discussion plus **Plenary I: John Paul Strachan (17:00-18:00)**	16:00-18:00
Dinner	18:00-19:30
Evening lecture: Yes Fregnac, From metaphors of the human mind to the myth of digital consciousness	19:30-20:30

DAY 2: 26/10/2023

SESSION 3/1: Guides from Nature: neuroscience, theoretical biology, complex systems. Chair: Mihai Petrovici	9:00-10:30
Keynote: Walter Senn, A theoretical physics guide to neuroscience and cognition	9:00-10:00
GN.C1: **Younes Bouhadjar**, Bio-inspired sequence learning mechanisms and their implementation in a memristive neuromorphic hardware	10:00-10:30
Coffee break	10:30-11:00

SESSION 3/2: Guides from Nature: neuroscience, theoretical biology, complex systems.	11:00-12:00
GN.C2: **Kevin Max**, Learning efficient backprojections cross cortical hierarchies in real time	11:00-11:30
GN.C3: **Tanguy Cazalets**, New insights on homeostatic activity-dependent structural plasticity in rate based neural networks	11:30-12:00
Lunch break	12:00-13:30
SESSION 4: Scaling Up: modular architectures, complex data structures and processes. **Chair: Christopher Bennett**	13:30-16:00
Keynote: Brad Aimone, The Pursuit of the Brain's Ubiquitous Stochasticity	13:30-14:30
SU.C1: **Alpha Renner,** Neuromorphic hyperdimensional visual scene factorization	14:30-15:00
SU.C2: **Volker Sorger**, PhotoFourier: Silicon photonics fourier transformation for JTC neural networks	15:00-15:30
SU.C3: **Ria Talukder,** Large scalable electro-optical spiking neural network	15:30-16:00
Coffee discussion	16:00-17:00
Poster session I	17:00-19:00
Banquet	19:00-21:00

DAY 3: 27/10/2023

SESSION 5/1: APplications: demonstrators, use-cases, user interfacing, hybrid solutions. Chair: Xavier Porte	9:00-10:30
Keynote: Chiara Bartolozzi, Neuromorphic engineering to improve robotic perception	9:00-10:00
AP.C1: **Fabian Boehm**, Teaching Ising machines new tricks: Accelerating Monte-Carlo sampling and machine learning	10:00-10:30
Coffee break	10:30-11:00
SESSION 5/2: APplications: demonstrators, use-cases, user interfacing, hybrid solutions.	11:00-12:00
AP.C2: **Nathan Leroux**, Spiking Online Transformer with for Fast Prosthetic Hand Control	11:00-11:30
AP.C3: **Mustafa Yildirim**, Nonlinear Computing with Lithium Niobate Waveguide	11:30-12:00
Lunch break	12:00-13:30
Plenary II: Harish Bhaskaran, Higher-dimensional processing using a photonic tensor core with continuous-time data	13:30-14:30
Coffee discussion	14:30-15:30
Poster session II	14:30-17:00
Poster prize and closing remarks	17:30-18:00